

As also required under 37 C.F.R.1.121, and pursuant to the present Amendment, a clean version of the Abstract of Disclosure is as follows:

ABSTRACT OF DISCLOSURE

A planar laser illumination and imaging (PLIIM)-based hand-supportable linear imager employing linear electronic image detection arrays and optically-combined planar laser illumination beams (PLIBs) produced from a multiplicity of laser diode sources to achieve a reduction in speckle-pattern noise power observed therein. The device has a hand-supportable housing with a light transmission window, and a PLIIM-based image capture and processing engine disposed in the hand-supportable housing. The engine includes a 1-D (i.e. linear) image formation and detection module, a linear image detection array, and image formation optics with a field of view (FOV) projected through the light transmission window into an illumination and imaging field external to the hand-supportable housing. A pair of planar laser illumination arrays (PLIAs) is mounted within the hand-supportable housing and arranged on opposite sides of the linear image detection array. Each PLIA comprises a plurality of planar laser illumination modules (PLIMs), for producing a plurality of spatially-incoherent planar laser illumination beam (PLIB) components, each being arranged in a coplanar relationship with a portion of the FOV. Each PLIM includes a laser diode source and beam diverging optics for producing one spatially-incoherent PLIB component, and an optical element for optically combining and projecting the plurality of spatially-incoherent PLIB components through the light transmission window in coplanar relationship with the FOV, onto the same points on the surface of an object to be illuminated. In accordance with the present invention, the linear image detection array detects time-varying speckle-noise patterns produced by the optically-combined spatially-incoherent PLIB components reflected/scattered off the illuminated object, and the time-varying speckle-noise patterns are then time-averaged at the linear image detection array during the photo-integration time period thereof so as to reduce the RMS power of speckle-pattern noise observable at the linear image detection array.